Executive Summary

In September 1990, the National Library of Medicine's Board of Regents recommended that as part of its continuing long range planning effort, the Library assemble a panel of experts to evaluate the goals, objectives, and scope of NLM's Toxicology Information Program, considering current and likely future requirements for information and data in toxicology and environmental health. A panel of distinguished experts in these areas was assembled and met three times in 1991 and 1992. The work of this panel culminated in this report to the Board of Regents.

The National Library of Medicine has operated a Toxicology Information Program (TIP) to create and provide information services in toxicology and environmental health for the last quarter century. A brief history of this Program is outlined in Appendix A. Although modest in resources, the TIP has been ambitious in scope and rich in accomplishments. In many cases these accomplishments have been directly attributable to a high degree of cooperation with other Federal agencies that brought with it not only expertise and guidance, but also the solution of joint problems and the provision of interagency resources to the Program.

The Panel was asked to review whether the needs of the users of toxicology and environmental health information services were being met and what changes might be needed to respond to changing circumstances and to take advantage of new opportunities. The ensuing report posits three broad goals and, under these goals, makes 16 specific recommendations.

GOAL 1: Provide Selected Core Information Resources and Services for Toxicology and Environmental Health

Recommendation 1.1. NLM should evaluate systematically the adequacy and extent of current library services in order to guide an expansion of its activities in collection building, cataloging, indexing, document delivery, and reference services in the subject areas of toxicology and environmental health. The Library should consider expansion of its MeSH indexing vocabulary and of the Unified Medical Language System (UMLS) project to accommodate these subjects. In addition, NLM should investigate the desirability of expanding its linkage to the several major libraries having substantial collections in these subject areas that are not now members of the National Network of Libraries of Medicine, offer to incorporate them into that network, and expand the network's interlibrary loan activities accordingly.

Recommendation 1.2. The NLM should extend its current outreach efforts to those working in toxicology and the environmental health sciences in an effort to ascertain from present and potential users the value of NLM's current database offerings and the need for additional database elements, components, or services. This effort should become part of a formal evaluation under which NLM periodically reassesses the contents and organization of its suite of toxicology and environmental health databases. NLM should evaluate the information needs of user

group categories that may not be well served by current offerings (e.g., practitioners of occupational and environmental medicine). A new user advisory group should provide advice on selection of databases for NLM's systems, and function as a forum for user feedback.

Recommendation 1.3. Based in part on the results of evaluation activities recommended in recommendation 1.2, NLM should develop a plan and a set of priorities for enhancing and expanding its information services to include additional data elements and, when expressly warranted, the offering of new factual, numeric, and geographic databases. A new user advisory group should provide advice on enhancing and refining NLM databases.

Recommendation 1.4. The contents of NLM's toxicological and environmental health databases should be integrated, where possible, so that they have common data elements, access methods, and indexing methodologies, and a consistent interface and uniform style. The objective is to allow these databases to be searched as a unit and ultimately linked with all MEDLARS databases.

Recommendation 1.5. NLM should include quality indicators and/or descriptors suitable for characterizing the sources of the contents of the databases available on its systems. This would include both databases produced by the NLM and, so far as possible, the offerings of other database producers distributing information via the NLM system. NLM should take a leadership role in encouraging other database producers to adopt quality indicators. Where such quality indicators do not

exist, NLM should attempt to establish indicators for NLM databases, and should make every effort to encourage adoption of successful indicators by other database producers.

GOAL 2: Facilitate Access to National and International Information Resources for Toxicology and Environmental Health

Recommendation 2.1. NLM should focus attention on the ease with which end users can access toxicological and environmental health information. New computer and information science technologies such as intelligent electronic gateway systems and artificial intelligence should be thoroughly evaluated and exploited, and combined with the results of studies of user needs to improve user access.

Recommendation 2.2. NLM should develop a directory of existing and accessible toxicological and environmental health information resources, using online computer and other distribution means. The directory should serve as a locator tool and an electronic linkage among the principal databases. It should facilitate users' access to databases that may not otherwise be easily available, especially non-NLM databases. Such a directory of information resources, while a large undertaking, should have as one goal to be an essential tool for risk assessment activities in Government and industry. This major task should be undertaken by NLM in concert with a new user advisory group.

Recommendation 2.3. As part of the High Performance Computing and Communications initiative, NLM should undertake further development of the Information Sources Map as a possible mechanism for implementing the directory for toxicology and environmental health information resources. Emphasis should be placed on databases supportive of health risk assessment activities.

Recommendation 2.4. Working with ATSDR, EPA, CDC, and other organizations with direct responsibility for emergency preparedness and response, NLM should continue its research to improve access to information helpful for these organizations and local agencies in managing emergencies such as chemical spills. Other information sources that are shown to be useful in emergency situations should be added to the ATSDR/NLM Workstation for Emergency Response (ANSWER) workstation.

Recommendation 2.5. NLM's current outreach efforts to improve access to toxicological and environmental health information by health professionals working with underserved populations should be strengthened. NLM should continue to place special emphasis on efforts directed to minority health education institutions and the communities they serve.

Recommendation 2.6. NLM should continue its historical emphasis on serving the information needs of professionals. While improved accessibility to NLM's databases should be established primarily for scientists and health officials, new access mechanisms for databases such as the Toxic Chemical Release Inventory (TRI) should be devel-oped for the general public as well as professionals, and NLM should study the costs and benefits of such experiments.

Recommendation 2.7. NLM should systematically review international sources of relevant information and establish formal links with organizations whose databases would contribute to NLM's main goals in toxicology and environmental health. The review should pay special attention to the sources of information that may become available in Eastern Europe and Asia. NLM should collaborate with international programs in toxicology and environmental health such as those operated by the United Nations (UN) and its specialized agencies, the Organization for Economic Cooperation and Development (OECD), and the European Community, with the goal of facilitating access to these information resources by U.S. users. When resources permit, NLM should also offer technical assistance to countries endeavoring to improve their health and environmental databases.

GOAL 3: Strengthen the Information Infrastructure for Toxicology and Environmental Health

Recommendation 3.1. NLM should investigate possible new information structures and representations that are being used to aid in the understanding of the scientific basis of environmental effects on molecular and cellular systems. When there is sufficient accumulation of data, NLM should specify and design a prototype system for linking

chemical and toxicological data with a limited set of molecular databases, concentrating on toxic effects at the molecular and cellular level.

Recommendation 3.2. NLM should, expand its existing medical and biotechnology informatics research grants program to extend such research into areas that would advance the handling and use of toxicological and environmental health information, and in particular to facilitate research in the field of molecular toxicology.

Recommendation 3.3. NLM's authority should be amended to enunciate specifically the Library's continuing and expanding responsibilities in the areas of toxicology and environmental health.

Recommendation 3.4. The National Academy of Sciences Toxicology Information Program Committee (TIPCOM) should be expanded in membership and scope of responsibility, and assume a more vigorous role in advising NLM in operational and technical matters, program policy, and new areas of science that should be addressed. A user advisory group comprised of representatives of NLM's enhanced user community should be organized under the auspices of TIPCOM to provide needed feedback on current and anticipated database offerings.